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Chapter 11 – Trees and Construction

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TREES & CONSTRUCTION

Loss of forest cover in Maryland occurs primarily as a result of increased development and urbanization.

Construction damage is one of the greatest causes of tree death and decline in urban areas.

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According to ANSI A300, development impacts that can damage trees directly include:

- severing roots
- severing branches
- soil compaction

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The most serious damage caused by construction is underground from construction activities that cause soil compaction and root damage.

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According to ANSI A300, the critical root zone is the minimum volume of roots necessary for maintenance of tree health and stability.

The Critical Root Zone of specimen tree (30" dbh or greater) is a circle with a radial distance of 1.5 feet for every 1" dbh.

The Critical Root Zone of a nonspecimen tree (less than 30" dbh) is a circle with a radial distance of 1.0 feet for every 1" dbh with a minimum of 8 feet.

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According to ANSI A300, tree protection devices such as fencing, berms, or signage can be installed prior to site work to limit access to tree protection zones.



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Soil compaction can be devastating to trees.

Most of a tree's absorbing roots are in the upper 12" of soil to get oxygen and water.

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Ability to absorb oxygen, water & minerals is reduced when soil is compacted.

The pore space between soil particles is greatly reduce.

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For temporary traffic over the root zone, can use vertical mulching and then place 6-12" of mulch to disperse the weight of equipment.

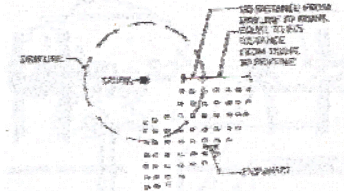
When construction is finished, half of the depth can be removed and spread out over the area under the drip line as mulch.

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Sometimes aeration systems are installed to help preserve trees, although there is little research to confirm the value of these systems.



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When the grade is lowered during construction activity, it is referred to as a cut.

Changes in grade can effect:

- root volume;
- aeration;
- drainage.

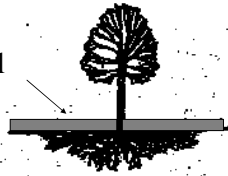
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A tree island may be used where the grade has been lowered completely around the tree.

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If the grade is raised, roots may be suffocated.

Additional soil



As little as
4" of soil
can kill some
species.

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If few to no roots over 1 inch in diameter will be impacted by construction activity, the tree will probably tolerate the impact.

Most healthy trees are able to tolerate removal of one-half of their absorbing roots (not structural roots) without serious effect.

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During the construction phase of a project, the tree expert or arborist should monitor tree health and compliance with tree protection zones.

Levels of compliance with tree protection specifications and goals should be documented and reported.

Symptoms and signs of construction damage

Crown - Slow rate of growth, staghorns, or dieback

Leaves - Wilted, scorched, sparse, undersized, distorted, chlorotic, browning leaf margins, premature autumn color, or premature leaf drop

Trunk - Wounds, bark removed, crown rot, absence of buttress flares, adventitious sprouting, suckering, and severe insect damage and disease

Symptoms and signs of construction damage

Branches - Dieback, slow growth rate, wounds, adventitious sprouting, or suckering

Fruits and flowers - Abnormally large crop or absence of fruit, flowering out of season.

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In the event of damage to tree protection zone barriers and/or trees within them, corrective measures should be specified and implemented.

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Treatment of damaged trees should begin when the damage occurs. If a significant portion of the root system is destroyed, then the remaining root system should be pampered.

Mulch it to hold soil moisture, moderate temperature extremes and remove competition from turfgrasses and weeds.

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To be effective, tree preservation planning must occur prior to construction.

The initial step is to perform a site survey of all relevant features, including a tree resource evaluation completed during the project's planning phase .

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According to ANSI A300, a survey is a description of all trees based on a representative sample, compared to an inventory which is a comprehensive listing of individual trees.

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A Tree Expert, arborist, or other qualified professional shall complete the tree resource.

If a condition is observed requiring attention beyond the original scope of work, the condition shall be reported to an immediate supervisor, the owner, or the person responsible for authorizing the work.

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During the planning phase, trees included in the resource evaluation should be assigned suitability for conservation ratings.

Ex:

Good = good health, structural stability, & potential for longevity at the site;

Moderate = fair health, moderate structural defects, & require more intense management;

Poor = poor health, significant structural defects, & are expected to decline regardless of management.

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According to ANSI A300, factors to consider when evaluating suitability for conservation:

tree health

structural integrity

species response to construction impacts

tree age and longevity

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According to ANSI A300, a tree management report should be developed during the design phase of the project and should include:

- Tree locations
- Description of the tree population
- Suitability for conservation ratings
- Limits of construction
- evaluation of effects to the trees

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According to ANSI A300, a tree management report should be developed during the design phase of the project and should include (cont.):

- proximity of trees to existing & proposed features
- recommendations for retention or removal
- recommendations for design changes
- tree conservation specifications
- post-construction recommendations

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According to ANSI A300, a tree conservation plan should be developed during the pre-construction phase of the project.

The plan should also include consequences for non-compliance.

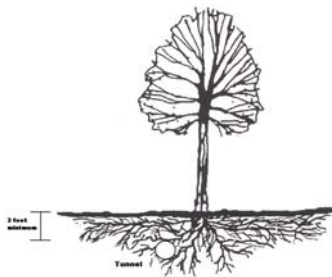
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It is commonly thought that a healthy tree can tolerate removal of approximately 1/3 of its roots.

Trenching can severely injure a tree. Instead, auger under roots.

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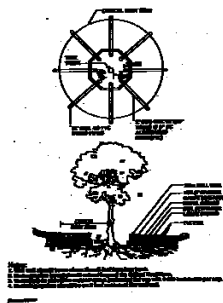
Tunneling may be used instead of trenching to minimize impacts to a tree's critical root zone.



Minimum depth should be 24”.

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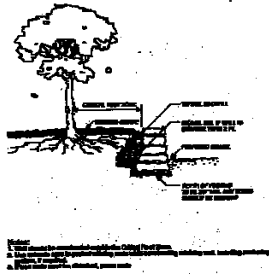
Tree wells and retaining walls are scheduled for installation during the construction process to allow tree retention when changes in grade are required.



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TREES & CONSTRUCTION

Tree wells and **retaining walls** are scheduled for installation during the construction process to allow tree retention when changes in grade are required.



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Retained trees located along the Limits of Disturbance (LOD) should be evaluated for susceptibility to windthrow.

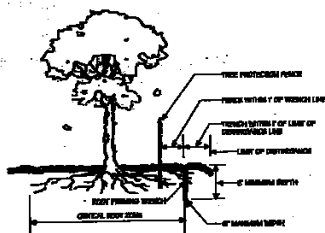


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Pruning roots prior to construction can help avoid impacts to Critical Root Zone.

Roots should be cleanly cut using vibratory knife or other acceptable equipment.



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Backfill trench with soil to minimize drying of the roots.

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If root damage occurs, the remaining roots must be pampered.

Mulch to hold soil moisture, moderate temperature, and remove competition from turf and weeds.

Regular irrigation is most effective. Trees that do not become moisture stressed have better survival rate.

Maintain the tree's vitality to avoid stress and infestation of insects and diseases.

If fertilizer with nitrogen is needed, use slow-release form after period of recovery.

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Success in tree preservation during construction is measured when the trees thrive years after project completion.

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More than 80% of real estate agents surveyed in 1994 by Bank America Mortgage feel that a home and lot with trees is as 20% more salable than those without them.

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Conclusion

Good pre-construction planning

Keep equipment & personnel out of Critical Root Zones

Use sharp tools for root pruning if needed

Minimize grade changes around trees

Use proper mitigation techniques if disturbance cannot be avoided.

Maryland Department of Natural
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